Schrödinger operator with a measure potential: the weak coupling constant asymptotics

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Abstract

We consider a two dimensional Schrödinger operator corresponding to the formal expression

$$H_{\alpha\mu} = \Delta - \alpha\mu\,,$$

where $\alpha > 0$ and μ stands for a positive Radon measure on $\mathbb{R}^2$. We show that for the weak coupling constant limit, i.e. $\alpha \to 0$ operator $H_{\alpha\mu}$ has a unique eigenvalue. Furthermore, we derive the asymptotics for this eigenvalue as well for the corresponding eigenfunction if $\alpha \to 0$. The talk is based on the common work with Vladimir Lotoreichik.